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no more praise than they really deserve; and he expresses his opinion that the present communication, and the observations upon which it is founded, have deprived Mount Ararat of that superior altitude in the Eastern world which has hitherto been attributed to it. But the fact is, that geographers, particularly the venerable Humboldt, have not placed the Ararat of geographers in this category. I have looked into the last volume of 'Cosmos' to-day, and Humboldt records the height of Demavend at 19,715 feet, which is but 1785 feet under the height attributed to it by our diplomatists. According to Humboldt, Ararat is only 17,112 feet high.

GENERAL MONTEITH, F.R.G.S.—Having passed three years at the foot of Mount Ararat, I am well acquainted with that mountain. I used many means to ascertain its elevation, and I made it 16,000 feet above the level of the Araxes—I mean the Ararat of modern geographers, in the province of Erivan. I was not so fortunate as to reach its summit—though I attempted the ascent with several men—in consequence of the mountain being so thoroughly capped with ice. With regard to Mount Demavend, I have seen it, but did not attempt to ascend it—not from want of curiosity, but from want of time. I had the opportunity of seeing the Demavend from the summit of one of the range of mountains across the Caspian Sea. The distance from me was 248 miles, and I was at an elevation of 7000 feet at the time. I hurried down to the village to get instruments, but unfortunately I missed the opportunity of seeing the mountain again.—Near the village of Khloor, at the foot of the mountains between Ardabet and the Caspian, though I had a tent and guard for seven days, the atmosphere was never again clear of mist. The Mount of Demavend appeared to me not to be more than twice the height of the general range, and of the same I was on, which by boiling water gave 7000 feet above the Caspian. Ararat, I may say, in appearance at least, is higher than any mountain in Persia, or even the Caucasus. One-third of the mountain is buried in perpetual snow and ice, so as to reflect a strong light like glass when the sun shines on it; in this particular it differs from any other mountain I have seen.

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The second Paper read was :—

2. *Expedition from Moreton Bay in Search of Leichhardt and Party.* By AUGUSTUS CHARLES GREGORY, Esq. (Gold Medallist, R.G.S.).

8th Dec. 1857.—Having received instructions from the Honourable the Secretary for Land and Public Works to organize an expedition for the purpose of searching for traces of Dr. Leichhardt and party, who left New South Wales in 1848 with the intention of proceeding overland to Western Australia, I proceeded to Moreton Bay (11th Jan. 1858) with such portions of the equipment as had been prepared in Sydney.

On reaching Ipswich forty horses were purchased, and having despatched the stores to Mr. Royd's station, on the Dawson River, by drays, the party was collected at that place; but, owing to unforeseen delays in the transport of the stores, the equipment and organization of the expedition were not complete till the latter part of March.

The following list of the party, horses, stores, &c., will show the principal arrangements.

The party consisted of nine persons, viz. :—

A. C. Gregory, *Commander* ; C. F. Gregory, *Assistant-Commander* ; S. Burgoyne, *Assistant* ; G. Phibbs, *Overseer*. *Stockmen, &c.*, R. Bowman, W. Selby, T. Dunn, W. Wedel, and D. Worrell.

The stock consisted of horses alone, comprising 31 pack and 9 saddle horses, completely equipped.

Provisions comprised the dried meat of 2 bullocks and 4 sheep, weighing, as butcher's meat, 16 cwt., but when dried and the bones removed, reduced to 300 lbs. ; in addition to this, 500 lbs. bacon, 1600 lbs. flour, 100 lbs. rice, 350 lbs. sugar, 60 lbs. tea, 40 lbs. tobacco, and some minor articles.

The arms and ammunition were : 1 Minié rifle, 8 double-barrel guns, 9 revolver pistols, 25 lbs. gunpowder, 150 lbs. shot and balls, percussion caps, &c.

For the conveyance of water two leather water-bags were provided, each holding 5 gallons, besides which each of the party was furnished with a water-bag of India-rubber, holding 3 pints.

The tents were made of calico, each suited for the accommodation of two persons, and the several articles of camp equipage were of the lightest construction consistent with the service required.

The instruments employed were an 8-inch sextant, box-sextant, prismatic compasses, pocket compasses, double axis compass, aneroid barometers, thermometers, and artificial horizon, &c.

Including forty sets of horseshoes, farrier's and carpenter's tools, together with sundry material for repairs, &c., the total weight of the equipment was about 4600 lbs. exclusive of the saddles and harness, which gave an average load of 150 lbs. as the net load carried by each pack-horse.

*24th March.*—These arrangements being complete the expedition left "Juanda" and proceeded by the road to Mr. Carew's station at "Euroomba," from which (*27th March*), under the guidance of Mr. Bolton—whose local knowledge was of material service—we made our way through the dense scrubs and broken country to the west for about 30 miles, to the head of "Scott's Creek," a small tributary of the Dawson River.

*29th March.*—The general course was now W.N.W., through a country with rich grassy valleys and dense scrubs of "brigalow" acacia on the higher ground. Green grass was abundant at this time ; but I fear that in seasons of drought few of the water-holes are permanent. The timber consists of iron-bark, box, and a few other species of eucalyptus ; the brigalow acacia attaining the height of

30 feet. Soft brown sandstones of the coal measures are the prevailing rock, forming hills with table summits.

*2nd April.*—With some difficulty, owing to the dense scrubs, we crossed the basaltic ridge which divides the eastern waters flowing to the Dawson River from those trending to the west into the basin of the Maranoa River, a tributary of which, probably the Merivale River, was followed westward. The country became more sandy, timbered with iron-bark, cypress, &c. The whole was, however, well grassed, and suited for grazing, if not too heavily stocked.

*5th April.*—Reaching the Maranoa River in about latitude  $25^{\circ} 45'$ , water was scarcely procurable in the sandy bed, and we had to dig wells to obtain a supply.

Warned by the fact that Messrs. H. Gregory and Hely had been unable to penetrate the country to the west from scarcity of water, even three months earlier in the season, we followed up the Maranoa to "Mount Owen" (*7th April*), and having found a sufficient supply of water and grass for a few days' halt, I proceeded to reconnoitre the country to the west, and at length found a practicable route to the tributaries of the "Warrego" River, to which the party was advanced (*12th April*).

A heavy shower of rain had filled the gullies in this locality, and green grass clothed the country, forming a striking contrast to the dry and waterless valley of the Maranoa.

Fine openly timbered valleys, well suited for pasture, alternated with ridges of scrub of brigalow acacia till we reached "Mount Playfair" (*15th April*), a basaltic hill on the sandstone ridge which separates the Warrego Valley from that of the "Nive," a small branch of which was followed (*16th April*) down to its junction with the main channel in latitude  $25^{\circ} 6'$ .

The soil in the valley of the Nive is sandy, thinly grassed, and openly timbered with iron-bark, spotted gum, &c.; the back country rising into low sandstone ridges, covered with dense scrub of brigalow acacia. Some pools of permanent water, containing small fish, were passed, on the bank of which the remains of numerous native camps were seen.

*17th April.*—From the Nive River a N.N.W. course was pursued through a nearly level sandy country, covered with a scrub of acacia, eucalypti, bottle-tree, &c., which offered great impediments to our progress, till within 6 miles of the "Victoria River," when we suddenly emerged from the scrub on to open downs of rich clay soil; but the drought had been of such a long continuance that the whole of the vegetation had been destroyed and swept away by the wind, leaving the country to all appearance an absolute desert.

The bed of the Victoria was scarcely 10 yards wide, and perfectly dry, so that it was only after a prolonged search along its course that a small puddle of water was found in a hollow of the clay flat, and near it, fortunately for our horses, a little grass growing in widely scattered tufts.

Being now on the line of route which Leichhardt had stated his intention of following, the party was divided, so that both sides of the river were examined in all probable positions in which his camps might have been situated (19th April); but as the high floods appeared to have inundated the country for nearly a mile on each bank last year, all tracks of previous explorers were necessarily obliterated, and it was only by marked trees, or the bones of cattle, that we could hope to discover any trace.

During the first two days' journey down the river only a few small pools of water were seen, and these not of a permanent character, while the rich vegetation on the open downs, which had excited the admiration of Sir T. Mitchell on his discovery of the country in a favourable season, had wholly passed away, leaving little but a bare surface of clay, the deep fissures in its surface giving evidence of long-continued drought.

20th April.—In latitude  $24^{\circ} 37'$ , longitude  $146^{\circ} 13'$ , a small sandy creek, of equal size with the Victoria, joined from the east, and just below the first permanent pool of water was found. There was a slight improvement in the grass, but dense scrubs prevailed in the back country, and even approached the river at intervals.

21st April.—While collecting the horses near this pool of water, I detected a party of armed natives watching one of the stockmen, evidently, from their position in the scrub and general movements, inclined to hostilities, and I imagine that it was a knowledge that we were aware of their intentions which prevented my being able to establish any communication with them. I may here remark that this party, which numbered about eight, were the first natives seen during the journey.

21st April.—(Lat.  $24^{\circ} 35'$ , long.  $146^{\circ} 6'$ .) Continuing our route along the river we discovered a "Moreton Bay Ash" (*Eucalyptus sp.*), about two feet diameter, marked with the letter L on the east side, cut through the bark, about four feet from the ground, and near it the stumps of some small trees which had been cut with a sharp axe, also a deep notch cut in the side of a sloping tree, apparently to support the ridge-pole of a tent, or for some similar purpose; all indicating that a camp had been established here by Leichhardt's party. The tree was near the bank of a small reach of water, which is noted on Sir T. Mitchell's map: this, together with its actual and

relative position as regards other features of the country, prove it not to have been either one of Sir T. Mitchell's or Mr. Kennedy's camps, as neither encamped within several miles of the spot, besides which, the letter could not have been marked by either of them to designate the number of the camp, as the former had long passed his 50th camp, and the latter had not reached that number on the outward route, and numbered his camps from the farthest point attained on his return journey.

Notwithstanding a careful search, no traces of stock could be found. This is, however, easily accounted for, as the country had been inundated last season, though the current had not been sufficiently strong to remove some emu bones and mussel-shells which lay round a native camping-place within a few yards of the spot.

No other indications having been found, we continued the search down the river, examining every likely spot for marked trees, but without success.

The general aspect of the country was extremely level, and even the few distant ridges which were visible had but small elevation above the plain, the highest apparently not exceeding 200 or 300 feet. Timber was wholly confined to the bank of the river, and though open plains existed, acacia scrubs were the principal feature.

Water became very scarce in the channels of the river, and we were principally dependent on small puddles of rain-water from a recent thunder-shower, but as we approached the northern bend some fine reaches of water were passed.

*6th April.*—In latitude  $24^{\circ} 2'$  we observed a small dry creek joining from the N.E. This I traced upwards for a few miles; but as its relative position with regard to the adjacent country, as well as the latitude, did not correspond with that of the Alice River on the chart, we continued our route; finding, however, that the general course of the river changed to S.W., I left the party at a small lagoon and rode up the river again (*28th April*), making a second search, more especially at the junction of the small dry creek, which proved to be identical with the Alice River, though more than five miles to the south, as the Victoria River never reaches the parallel of  $24^{\circ}$ .

Our position was now becoming very critical, as a long continuance of drought had not only dried up all the water, except in the deepest hollows in the channel of the main river, but the smaller vegetation, and even the trees on the back country were annihilated, rendering the country almost impracticable from the quantity of fallen dead branches, and even in the bed of the river, where the inundation derived from heavy rain near the sources of the river

last year had somewhat refreshed the grass, it was scarcely possible to find subsistence for the horses. Under existing circumstances, it would have been certain destruction to attempt a north-west route from this point; and the only course that appeared open to us was to follow down the main river to the junction of the Thompson River, and ascend that watercourse so as to intersect Leichhardt's probable line of route, had he penetrated in that direction, favoured by a better season. At the same time it was probable that, like ourselves, he had been repulsed, and would then follow down the river, and search for a more favourable point from which to commence his north-west course, in order to round the desert interior on its northern side (*29th April*), and we therefore continued our search down towards the Thompson River.

The country was perfectly flat on both sides of the river, and showed traces of tremendous floods. The soil near the river was often deeply-cracked mud, water very scarce, and grass seldom seen. The back country was covered with scrubs of dead acacia, the soil a red sand or gravel; and such was the unpromising appearance that I began to fear our horses would soon fail for want of food and water; but having camped at a water-hole during Sunday (*2nd May*), to rest the party, heavy rain commenced, and though the greater portion of the water was absorbed by the dry soil, some of the channels of the river filled and commenced to flow. This relieved us from much difficulty as regarded the want of water, and enabled us to seek for grass in positions which were otherwise inaccessible.

*3rd May.*—Just as we were leaving our camp a party of seven natives made their appearance, but, though they came up to us, and talked much, I could get no useful information from them. As the party moved on they followed us, and, thinking they were not observed, made an attempt to throw a spear at one of the men; but Mr. C. Gregory wheeling his horse quickly and presenting a revolver at the intending aggressors, they ran away and left us to pursue our journey in peace.

The abundance of water was not without its inconveniences, and had the rain continued the party would have been annihilated, as our camp was between the deep channels which intersected the plain; and in attempting to extricate ourselves from the plains subject to inundation (*4th May*), found ourselves so completely entangled among the numerous deep channels and boggy gullies, in some of which the horses narrowly escaped suffocation in the soft mud, that after having forded one branch of the river, carrying the whole equipment across on our own backs, constructing a bridge over a second for the transport of the stores, and dragging the horses

through as we best could with ropes, after three days of severe toil we had scarcely accomplished a direct distance of five miles (*6th May*).

The dry weather which followed rapidly hardened the surface of the clay plains, and I attempted to steer due west to the Thompson, but found the country so destitute of feed, and covered with dense acacia scrub, that we were compelled to return to the plains on the bank of the river.

*8th May.*—The valley of the river trending west was somewhat contracted, and did not exceed five or six miles in breadth; the plains were firmer, salt-bush and grass more abundant, and the horses recovered slightly from the effects of the barren country.

Keeping back from the right bank of the main channel, we passed some ridges of drift sand, and came on a fine lagoon nearly a mile in length. Here we surprised a party of natives, who decamped on our approach, leaving a net, fish, &c., which we of course left untouched, and camped at a spot lower down the lagoon.

*9th May.*—The next day, being Sunday, we remained at our camp, and the party of natives, consisting of seven or eight men, three or four women, and some children, approached us, and remained the greater part of the day near the tents. They were very anxious to enter the camp, but this was not permitted.

By signs they expressed that they had observed we had not taken away any of their property the evening before, when they ran away and left their nets, and were therefore satisfied our intentions were friendly; but we could not procure any information relative to the objects of our journey or the character of the country before us.

At 4 P.M. they informed us they were going to sleep at the most distant part of the lagoon, and would return next morning at sunrise, and then departed.

*9th May.*—After dark, however, the natives were detected attempting to crawl into the camp through the bushes, and though we called to them in an unmistakeable tone to retire, they would not withdraw.

As the position they had taken up was such as to command our camp, and render it unsafe in the event of an attack, it was necessary to dislodge them. I therefore fired a pistol over them, but was answered by a shout of derision, which no doubt would have been soon followed by a shower of spears had we not compelled them to retreat by a discharge of small shot directed into the scrub, after which we were not further molested.

*10th May.*—We were now approaching the junction of the Thompson River, but the country became worse as we advanced,



and the last 5 miles of the plain were absolutely devoid of vegetation. Our hopes were, however, raised on finding that the late rain had caused the Thompson to flow, though the current was not strong; we had, besides, to travel upwards of 12 miles up its course before any grass could be found for the horses.

11th May.—Continuing our route up the Thompson, nothing could be more desolate than the aspect of the country: except the few trees which grew on the immediate bank of the river, there was scarcely a tree left alive, while the plains were quite bare of vegetation, except a few salsolaceous bushes. At the distance of 5 miles low ridges of red drift sand showed the desert character of all around; even the lower surfaces of the clouds assumed a lurid tinge from the reflection of the bare surface of red sand.

12th May.—In latitude  $24^{\circ} 40'$  low sandstone hills, or rather table-land, approached both banks of the river, and the gullies which intersected them had supplied the water lower down, as the channel was dry above. We, however, succeeded in reaching latitude  $23^{\circ} 47'$  (15th May), when the absence of water and grass—the rain not having extended so far north, and the channels of the river separating into small gullies and spreading on the wide plains—precluded our progressing farther to the north or west; and the only prospect of saving our horses was to return south as quickly as possible.

This was a more severe disappointment, as we had just reached the part of the country through which Leichhardt most probably travelled, if the season was sufficiently wet to render it practicable.

Thus compelled to abandon the principal object of the expedition, only two courses remained open—either to return to the head of the Victoria River and attempt a northern course by the valley of the “Belyando,” or to follow down the river and ascertain whether it flowed into “Cooper Creek” or the Darling. The latter course appeared most desirable, as it was just possible that Leichhardt, under similar circumstances, had been driven to the S. W.

In order to ascertain whether any large watercourses came from the west, the return route was along the right bank of the Thompson, but only one small creek and some inconsiderable gullies joined on that side; nor was the country of a better character than on the left bank—consisting of barren plains, subject to inundation, low rocky ridges covered with dense scrub, and sandy ridges producing triodia.

22nd May.—We had nearly reached the Barcu, or Victoria River, when, in crossing a gully, Worrell's horse fell and hurt him so severely that we had to halt for some time before he could be placed

on his horse again, and it was therefore fortunate that a small patch of dry grass was found on the bank of the river, which enabled us to halt the next day (23rd May), which was Sunday.

Travelling down the right bank of the river the principal channels were full of water, but the clay plains between were quite dry, the rain which had caused the river to flow not having extended so far south; nothing could well be more desolate than the unbounded level of these vast plains, which, destitute of vegetation, extended to the horizon. Our horses were reduced to feeding on the decayed weeds, and even these were so scarce that they eagerly devoured the thatch of some old native huts.

27th May.—We had nearly reached the farthest point attained by Mr. Kennedy when the horses showed signs of failing strength, and the channels on the east side of the plain being dry, I conceived it prudent to cross to the western side again.

The dry mud was so deeply cracked that the horses were continually falling, and one horse was so completely exhausted that we had to abandon him.

28th May.—Steering a westerly, and then a north course, we reached the small water-hole at Mr. Kennedy's second camp on the return route; there was just sufficient water to supply the party for one night, and a few scattered tufts of grass near it, but quite insufficient for the supply of so large a number of horses.

Close to the water-hole we found Mr. Kennedy's marked tree; it was a large box-tree, marked on the north side thus: 

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 The cuts of the axe and chisel were still quite clear, though twelve years had elapsed; but the slow growth and decay of trees in the interior may be attributed to the dryness of the climate.

29th May.—Steering north-west, after toiling nearly 30 miles across this fearful waste of dry mud, we at length reached a small patch of grass on a sandy hummock, but only just in time to save the horses, as many could scarcely keep on their legs, and we had to remove their loads to those which were less exhausted.

30th May.—Long before the next morning our hungry animals had consumed every blade of grass, and the small patch round the camp was reduced to the same barren appearance as the surrounding plain. We therefore started in search of food for them, and were fortunate in finding a second patch of grass, about 3 miles to the south, and halted for the remainder of the day, which was Sunday, thankful that Providence had enabled us to make it a day of rest.

31st May.—The running channel of the river being still to the west of our position we steered south-west, over barren clay plains, to

some low ridges of drift sand, beyond which we found the channel full of water, with a slight current (lat.  $26^{\circ} 2'$ ); but it terminated in a large reach of water which had not yet filled, and the channel lower down was dry.

Low ridges of red drift sand were now frequent on the plain, and appeared to be the higher points of the former sandy desert, the clay plains resulting from the deposition of mud in the hollows between which had in course of time filled it to one uniform level.

*1st June.*—The channels on the western side of the plain were very irregular, sometimes completely lost on the level surface, and again collecting into large hollows, with box trees on the banks, in which fine sheets of water still remained, some 100 yards wide and more than a mile in length. We therefore did not experience so much inconvenience with regard to the supply of this necessary element as from the absence of sufficient grass, and the all but impracticable nature of the mud plains.

*4th June.*—In latitude  $27^{\circ}$  low sandstone table-land approached the west side of the river, and we attempted to travel along the slope between it and the mud plains, but found it so stony that the horses' hoofs were soon worn to the quick, as we had been compelled to remove their shoes to enable them to traverse the mud plains.

Had it not been for green bushes of *salsola*, and some similar plants which had sprung up since the rain, this tract of country exactly resembled the stony desert described by Captain Sturt, as existing 200 miles to the westward. These remarkable features forming the declivities of the sandstone table-land through which "Cooper Creek" forces its way, and by confining the waters to a narrower space during floods, causes the fine deep reaches of water which characterise it.

*8th June.*—By following the western limits of the plains we reached latitude  $27^{\circ} 30'$ , when the sandstone table-land receded, and a boundless expanse of mud plain was before us; the lines of box trees which had hitherto marked the channels nearly ceased, *polygonum* and *atriplex* constituting the main feature of the vegetation.

*9th June.*—After toiling S.W. a day and a half over this level surface to latitude  $27^{\circ} 50'$ , we approached some low ridges, at the foot of which there was a lagoon 100 yards wide, exhibiting signs of a current during flood to the N.W.; and as there was an evident westerly trend in all the smaller channels previously crossed, it was evident they would soon merge in Cooper Creek.

Steering W.N.W. the several channels collected together, and soon formed a deep watercourse, with fine reaches of water.

*9th June.*—The sandstone table land closed in on both sides; the

soil of the intervening plain was much firmer, but showed by the vegetation that saline nature which so often attends the development of the upper sandstones in Australia. Grass was abundant, and it was surprising with what rapidity the horses recovered their strength.

*12th June.*—Approaching the 141st meridian, which is the boundary of the province of South Australia, stony ridges closed in on both banks of Cooper Creek, forming almost a natural division, across which we followed a well-beaten native path; and here I observed the only instance which has come under my observation where the aborigines have taken the trouble to remove natural obstacles from their paths. The loose stones had been cleared from the track, and in some places piled in large heaps.

*14th June.*—After passing the stony ridge the valley became wider, the hills receding suddenly, in longitude  $140^{\circ} 30'$ , both to the north and south; and the whole country to the west seemed to consist of a succession of low ridges of red sand and level plains of dry mud, subject to inundation.

Shortly before reaching the branch of Cooper Creek, named by Captain Sturt "Strzelecki" Creek, we observed the tracks of two horses, one apparently a carthorse and the other a well-bred animal; but as none of their tracks were within the last month, the rain had obliterated them to such an extent that they could not be traced up, as they had left the bank of the creek on the first fall of rain, as is the usual habit of horses whose wanderings are uncontrolled.

There can be little doubt that these horses belonged to Captain Sturt, who left one in an exhausted state near this locality, and also lost a second horse, whose tracks were followed many miles in the direction of this part of Cooper Creek.

"Strzelecki Creek," which separates nearly at a right angle from the main channel, appears to convey about one-third of the waters of Cooper Creek nearly south, and, as we afterwards ascertained, connects it with Lake Torrens. We, however, continued to follow the channels which trended west for 30 miles, but large branches continually broke off to the south and west, and at length (*16th June*) the whole was lost on the wide plains of dry mud between the sand ridges; and, as there was no prospect of either water or grass to the west, I steered south and south-east for 50 miles over a succession of ridges of red drift sand, 10 to 50 feet high, running parallel to each other, and in a nearly north and south direction. Between these ridges we occasionally found shallow puddles of rain-water, or rather mud, as it was so thick with clay as to be scarcely fluid. Fortunately, a great quantity of green weeds had grown up since

the rain, and the horses improved in condition and did not require much water.

*21st June.*—In latitude  $28^{\circ} 24'$  we again came on Strzelecki Creek, and then followed it nearly S.S.W. between sandy ridges to latitude  $29^{\circ} 25'$ , when it turned to the west and entered Lake Torrens. (*25th June.*) No permanent water was seen in the bed of the creek, though there are many deep hollows which, when once filled, retain water for several months, and this, combined with the existence of a fine reach of water in Cooper Creek immediately above the point where Strzelecki Creek branches off, renders it far the best line of route into the interior which has yet been discovered.

Passing between the eastern point of Lake Torrens and what has hitherto been considered the eastern arm, but now ascertained to be an independent lake, the space between (about half a mile) was level sandy ground, covered with salicornia, without any apparent connecting channel. The course was continued S.S.W. towards Mount Hopeless, at the northern extreme of the high ranges of South Australia, which had been visible across the level country at a distance of 60 miles.

*26th June.*—As we approached the range of hills tracks of cattle and horses were observed, and 8 miles beyond Mount Hopeless came to a cattle station which had been lately established by Mr. Baker.

As the nature of the country we had traversed was such as not to admit of any useful deviations from it if we returned to New South Wales by land, I deemed it advisable to proceed forthwith to Adelaide, and, disposing of the horses and equipment, return with the party by sea to Sydney.

*31st July.*—We therefore proceeded by easy stages towards Adelaide, experiencing the greatest hospitality at the stations on our route, while our reception in the city was of the most flattering nature.

His Excellency Sir Richard Macdonald kindly gave me the use of an extensive paddock for the horses, and provided quarters for the men during the period which necessarily elapsed before the sale of the equipment of the expedition was effected. I have also to express my acknowledgments of the kind assistance rendered by the Honourable the Commissioner of Crown Lands, to the Surveyor-General, and the Superintendent of Telegraphs for valuable data connected with the construction of the map of the route, as well as to many other gentlemen whose cordial co-operation greatly facilitated my arrangements.

It is extremely gratifying to record my appreciation of the untiring zeal and energy which distinguished every individual composing the

expedition; and it is to the unvarying and cheerful alacrity with which each and all performed their respective duties, that, under Providence, the rapidity and success of the journey are to be mainly attributed.

With reference to the probable fate of Leichhardt, it is evident, from the existence of the marked camp, nearly 80 miles beyond those seen by Mr. Hely, that the account given to that gentleman by the natives of the murder of the party was untrue; and I am inclined to think only a revival of the report current during Leichhardt's first journey to Port Essington. Nor is it probable that they were destroyed until they had left the Victoria, as, if killed by the natives, the scattered bones of the horses and cattle would have been observed during our search.

I am therefore of opinion that they left the river at the junction of the Alice, and, favoured by thunder showers, penetrated the level desert country to the north-west; in which case, on the cessation of the rain, the party would not only be deprived of a supply of water for the onward journey, but unable to retreat, as the shallow deposits of rain-water would evaporate in a few days, and it is not likely that they would commence a retrograde movement until the strength of the party had been severely taxed in the attempt to advance.

The character of the country traversed, from the out-stations on the Dawson River to the head of the Warrego River, was generally that of a grassy forest, with ridges of dense brigalow scrub. A great portion is available for pastoral purposes, but not well watered; and the soil being sandy, the grass would soon be destroyed if too heavily stocked.

As we advanced into the interior it became more barren, and, except along the banks of the larger watercourses, destitute of timber; and the character of the vegetation indicated excessive droughts.

North of lat.  $26^{\circ}$  dense scrubs of acacia prevailed on the level country beyond the influence of the inundations; but to the southward sandy and stony deserts, with low shrubby vegetation, were the characteristic feature.

West of longitude  $147^{\circ}$ , nearly to the boundary of South Australia, in  $141^{\circ}$ , the country is unfit for occupation, for, though in favourable seasons there might in some few localities be abundance of feed for stock, the uncertainty of rain and frequent recurrence of drought render it untenable, the grasses and herbage being principally annuals, which not only die, but are swept away by the hot summer winds, leaving the surface of the soil completely bare.

On Cooper Creek, near the boundary, there is a small tract of second-rate country, which, being abundantly supplied with water,

may eventually be occupied. The best part is, however, within the Province of South Australia.

Between Cooper Creek and Lake Torrens about 120 miles of sandy country intervenes. This tract is destitute of surface water; but as it is probable that it could be obtained by sinking wells of moderate depth, I think it might be occupied to advantage during the cool season, and thus relieve the stations which are now established within Lake Torrens, though I fear that the summer heat would be too great to admit of permanent occupation.

The geological character of the country is remarkably uniform. Carboniferous sandstones and shales, containing occasional beds of coal, with superincumbent hills and ridges of basalt, extend from Darling Downs to the 146th meridian, where these rocks are covered by horizontal sandstones, with beds of chert and water-worn quartz pebbles. This latter formation extends as far as Mount Hopeless, where the slate ranges of South Australia rise abruptly from the plain.

The sandy deserts and mud plains are only superficial deposits, as the sandstones are often exposed where the upper formation is intersected by gullies.

The direction of the parallel ridges of drift sand appears to be the result of the prevailing winds, and not the action of water, it being sufficient to visit them on a windy day to be convinced that it is unnecessary to seek for a more remote and obscure cause than that which is in present operation.

It is, perhaps, with reference to the physical geography of Australia that the results of the expedition are most important; as, by connecting successively the explorations of Sir T. Mitchell, Mr. Kennedy, Captain Sturt, and Mr. Eyre, the waters of the tropical interior of the eastern portion of the continent are proved to flow towards Spencer Gulf, if not actually into it, the barometrical observations showing that Lake Torrens, the lowest part of the interior, is decidedly above the sea level.

Although only about one-third of the waters of Cooper Creek flow into Lake Torrens by the channel of Strzelecki Creek, there is strong evidence that the remaining channels, after spreading their waters on the vast plains which occupy the country between them and Sturt's Stony Desert, finally drain to the south, augmented probably by the waters of "Eyre Creek," the "Stony Desert," and perhaps some other watercourses of a similar character coming from the westward.

This peculiar structure of the interior renders it improbable that any considerable inland lakes should exist in connection with the

known system of waters; for, as Lake Torrens is decidedly only an expanded continuation of Cooper Creek, and therefore the culminating point of this vast system of drainage, if there was sufficient average fall of rain in the interior to balance the effects of evaporation from the surface of an extensive sheet of water, the "Torrens Basin," instead of being occupied by salt marshes, in which the existence of anything beyond shallow lagoons of salt water is yet problematical, would be maintained as a permanent lake.

Therefore, if the waters flowing from so large a tract of country are insufficient to meet the evaporation from the surface of Lake Torrens, there is even less probability of the waters of the western interior forming an inland lake of any magnitude, even should there be so anomalous a feature as a depression of the surface in which it could be collected, especially as our knowledge of its limits indicates a much drier climate and less favourable conformation of surface than in the eastern division of the continent.

The undulations of the surface of the country are nearly parallel to the meridian, gradually decreasing in height from the dividing range between the eastern and western waters till, instead of the waters of the rivers being confined to valleys, they occupy plains formed by a slight flattening of the curvature of the sphere. Thus the sides of the plain through which the river ran before it turned west to Cooper Creek were 150 feet below the tangential level of the centre channels, and even the summit of the sandstone table land which rose beyond was below the visible horizon.

It is this peculiar conformation which causes the stream beds to spread so widely when following the course of the valleys from north to south, and it is only where they break through the intervening ridges that the water is confined sufficiently to form well-defined channels.

The existence of these extensive valleys trending north and south over so large a tract of country, renders it by no means unlikely that they continue far beyond the limits of present explorations, and it is not unreasonable to infer that the great depression which has been traced nearly 500 miles north from Spencer Gulf through Lake Torrens to the stony desert of Sturt (or rather the mud plains contiguous to its western limit), may be continuous for an equal distance beyond to the low land at the head of the Gulf of Carpentaria; a theory also supported by the fact, that the rivers flowing into the Gulf either come from the east or west, apparently from higher land in those directions, while there is not a single watercourse from the south, or any indication of elevated country in that direction.

With regard to the number and habits of the aborigines, I could



gather little information, as only a collective number of about 100 men, a few women and children, were seen in small scattered parties; but, judging from the number of encampments seen, at least a thousand must visit the banks of the river; and it is probable that the whole of the inhabitants for at least a hundred miles on each side are dependent on it for water during the dry season.

Neither sex wear any clothing. Their weapons and utensils are similar to those used on the eastern coast; nor was there any characteristic by which they could be observed to differ from the aborigines of other portions of Australia.

Fish, rats, grass seeds, and a few roots, constitute their chief food.

On the upper part of the river they bury their dead, piling wood on the grave; near the junction of the Thompson they suspend the bodies in nets, and afterwards remove the bones; while on Cooper Creek the graves are mounds of earth 3 to 4 feet high, apparently without any excavation, and surmounted by a pile of dead wood. In the last-named locality the number of burial mounds which had been constructed about two years ago greatly exceeded the proportion of deaths which could have possibly occurred in any ordinary season of mortality, even assuming the densest population known in any other part of Australia; and it is not improbable that the seasons of drought which proved so destructive to the tree vegetation higher up the river may have been equally disastrous in its effects on the aboriginal inhabitants of this portion of the interior.

A. C. GREGORY.

*Sydney, 27th August, 1858.*

THE PRESIDENT.—I am happy to hear that the views of so experienced an Australian traveller as Mr. Gregory coincide with the opinion I have so frequently expressed as to the probable saline condition of the interior of Australia. This is the same gentleman who performed that remarkable journey from North Australia to Sydney, which obtained for him our Gold Medal. He is the first man who has gone far to determine the great problem, by journeys on three sides of Australia, that the great interior is a saline desert.

COUNT STRZELECKI, F.R.G.S.—The valuable paper which was just communicated to the Society suggests at its outset a painful reminiscence, and as painful regret that Mr. Gregory's expedition, undertaken with a view to ascertain the fate of the deeply-lamented Leichhardt, has failed in the humane object with which it was conceived, and that, like the preceding ones, it only adds fresh evidences of the indubitable loss which the public has sustained. The services of Leichhardt deserved indeed all the efforts which New South Wales has been making in search of him. In about 1840, while I was engaged in surveying the south of that colony, Leichhardt began his career of an explorer in the north of Moreton Bay: in 1846 he undertook and accomplished the perilous journey across from Brisbane waters to Port Essington, which, from its dangers, privations, and value of geographical discoveries, earned for him the well-deserved honours which this Society and the colony so justly bestowed upon him. Unfortunately, in the end or the commencement

of 1847, Leichhardt fell a prey to his praiseworthy attempt to traverse the continent from Moreton Bay to Swan River. His loss originated then a series of expeditions, among which that of Mr. Gregory deserves a most prominent place and notice from the range of scientific knowledge which it furnishes of the Australian continent. For although his expedition did not lead to the discovery of Leichhardt's traces, his different journeys from the north-east and south-east, performed towards the centre, girdle as it were the mysterious and impenetrable region of the interior of Australia, and facilitate thus the solution of that geographical problem. Considering then the services rendered to science by Mr. Gregory, this Society cannot but join cordially in the thanks to that distinguished explorer which are proposed to him from the chair.

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The third Paper read was :—

3. *Exploration of the Murchison, Lyons, and Gascoyne Rivers in Western Australia.* By Mr. F. T. GREGORY.

Communicated by the COLONIAL OFFICE.

Perth, July 26, 1858.

SIR,—In accordance with the instructions conveyed in your letter of the 15th March, authorising me to take the command of the Expedition to Shark Bay, in course of organization by the northern settlers, I have the honour to furnish the following report of our proceedings while on that service, for the information of his Excellency the Governor.

The preliminary arrangements having been completed, and the heavy portion of the stores forwarded by sea to Champion Bay, I left Perth on the 26th of March, accompanied by Mr. James Roe as second in command, chainer Fairburn having started the previous day with the team and light equipment of the expedition.

Proceeding by way of Toodyay to the Irwin River, the party were joined by Mr. W. Moore, with three horses; passing on by way of Champion Bay, we arrived at Koobijawanna, the point of general rendezvous, by the 10th of April. On the 12th the remainder of the stores arrived from Champion Bay, the party being augmented to six persons by the addition of Mr. C. Nairne and Dugel, an aboriginal policeman. This day and the following were occupied in weighing and packing stores, shoeing horses, &c.

14th April.—The equipment of the expedition being completed (with the exception of one horse to be procured at the Geraldine Mine), we moved on to Yanganooka, passing the Geraldine Mine on the 16th, and bivouacked on the Murchison River, 6 miles above the mine, having obtained the additional horse, making in all six saddle and six pack-horses; our supplies consisting of 60 days' rations, on a scale of  $1\frac{1}{2}$  lbs. of flour, 8 ozs. of pork, 4 ozs. of sugar, and  $\frac{1}{2}$  an